

# Seasonal and Interannual Variation in Blooms of *Alexandrium* spp. in the Strait of Georgia, Evaluated From Time Series of PSP Toxicity in the Sentinel Species *Mytilus californianus*

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## Abstract

The occurrence and distribution of PSP producing species of *Alexandrium* can be evaluated by bivalves, which are recent-time indicators of toxic bloom events. As toxin retention in bivalves is species specific, it is imperative that a standard sentinel species be used for comparative monitoring. A review of toxicity in *Mytilus californianus* collected by the Canadian Food Inspection Agency over the past 11 years indicated seasonal and inter-annual variance within and between collection sites in the Strait of Georgia. In general blooms of *Alexandrium* in the Strait occurred from May to December, but in some years no site-specific blooms were evident. Sites north of Departure Bay were infrequently high in toxicity. Highest toxicity in this area in the period of 1990 to 2001 was seen in Metcalf Bay at 430 µg STXeq/100g. However, south of Departure Bay, at Coffin Point, Vesuvius Bay, Burgoyne Bay and Patricia Bay high levels of toxicity were evident at two periods; May to August and September to December. Maxima of 4300 - 8800 µg STXeq/100g occurred at these sites in October 1997. Ganges Harbour, on the Strait side of Salt Spring Island, exhibited only minor blooms of *Alexandrium* relative to Vesuvius and Burgoyne Bays on the west side, reflecting geographical/environmental effects on algal growth. On the exposed mainland side of the Strait, blooms of *Alexandrium* were minimal with the highest value of 730 µgSTXeq/100g recorded at Smugglers Cove/Halfmoon Bay in June 1993. Eleven year maximum toxicity in mainland inlet sites such as Okeover Inlet (October 2000; 3,200 µg STXeq/100g) in the north, and Agamemnon Channel (October 1992; 1500 µg STXeq/100g) in the south, illustrate clearly the geographic and temporal variations in *Alexandrium* bloom formation in the Georgia Basin.